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IN THE CLAIMS:

1. (Currently Amended) A cryogenic fuel tank assembly comprising:
a cryogenic fuel tank wall;
a foam assembly affixed to said cryogenic fuel tank wall, said foam assembly having an inner surface and an outer surface;
a first solid film bonded to said outer surface to provide a uniform outer bonding surface; and
a semi-rigid thermal protection system assembly bonded to said uniform outer bonding surface.
2. (Original) A cryogenic fuel tank assembly as described in claim 1, wherein said foam assembly comprises a polyimide foam layer.
3. (Original) A cryogenic fuel tank assembly as described in claim 2, wherein said foam assembly further comprises a polyurethane foam layer applied inboard of said polyimide foam layer.
4. (Original) A cryogenic fuel tank assembly as described in claim 1, wherein said foam assembly comprises a polyurethane foam layer.
5. (Original) A cryogenic fuel tank assembly as described in claim 1, further comprising:
a honeycomb core positioned within said foam assembly.

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6. (Original) A cryogenic fuel tank assembly as described in claim 1, further comprising:

a silicon adhesive layer bonding said thermal protection system to said first solid film.

7. (Original) A cryogenic fuel tank assembly as described in claim 1, further comprising:

a polyurethane adhesive layer bonding said foam assembly to said cryogenic fuel tank wall.

8. (Original) A cryogenic fuel tank assembly as described in claim 1, further comprising:

a second solid film layer bonded to said inner surface to provide a uniform inner bonding surface, said uniform inner bonding surface bonded to said cryogenic tank wall.

9. (Original) A cryogenic fuel tank assembly as described in claim 1, wherein said uniform outer bonding surface further comprises:

a first fabric layer applied to said first solid film, said first fabric layer improving impact resistance of said cryogenic fuel tank wall.

10. (Original) A cryogenic fuel tank assembly as described in claim 9, wherein said first fabric layer comprises a glass fabric.

11. (Currently Amended) A reusable launch vehicle assembly comprising:

a cryogenic fuel tank including at least one cryogenic fuel tank wall;

a foam assembly affixed to said cryogenic fuel tank wall, said foam assembly having an inner surface and an outer surface;

a honeycomb core positioned within said foam assembly;

a first solid film bonded to said outer surface to provide a uniform outer bonding surface; and

a semi-rigid thermal protection system assembly bonded to said uniform outer bonding surface.

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12. (Original) A reusable launch vehicle assembly as described in claim 11, further comprising:

a first fabric layer applied to said first solid film, said first fabric layer improving impact resistance of said cryogenic fuel tank wall.

13. (Original) A reusable launch vehicle assembly as described in claim 11, further comprising:

a second solid film bonded to said inner surface to provide a uniform inner bonding surface, said uniform inner bonding surface bonded to said cryogenic tank wall.

14. (Original) A reusable launch vehicle assembly as described in claim 13, further comprising:

a second fabric layer applied to said second solid film, said second fabric layer improving impact resistance of said cryogenic fuel tank wall.

15. (Currently Amended) A thermally protected fuel tank assembly comprising:

a fuel tank wall;

a foam assembly affixed to said fuel tank wall, said foam assembly having an inner surface and an outer surface;

a first fabric layer bonded to said outer surface to provide a uniform outer bonding surface; and

a thermal protection system assembly bonded to said uniform outer bonding surface, said thermal protection system comprising ceramic tiles.

16. (Original) A thermally protected fuel tank assembly as described in claim 15, wherein said foam assembly comprises a polyimide foam layer.

17. (Original) A thermally protected fuel tank assembly as described in claim 16, wherein said foam assembly further comprises a polyurethane foam layer applied inboard of said polyimide foam later.

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18. (Original) A thermally protected fuel tank assembly as described in claim 15, further comprising:

a honeycomb core positioned within said foam assembly.

19. (Original) A thermally protected fuel tank assembly as described in claim 15, further comprising:

a silicon adhesive layer bonding said thermal protection system to said first fabric layer.

20. (Original) A thermally protected fuel tank assembly as described in claim 15, further comprising:

a second fabric layer bonded to said inner surface to provide a uniform inner bonding surface, said uniform inner bonding surface bonded to said cryogenic tank wall.

21. (Original) A thermally protected fuel tank assembly as described in claim 15, wherein said uniform outer bonding surface further comprises:

a first solid film applied to said first fabric layer.

22. (Original) A thermally protected fuel tank assembly as described in claim 20, wherein said uniform outer bonding surface further comprises:

a second solid film applied to said second fabric layer.

23. (Original) A method of insulating a fuel tank comprising:
applying a foam assembly to a fuel tank wall, said foam assembly having an inner surface and an outer surface;

generating a uniform outer bonding surface on said outer surface by bonding a first solid film to said outer surface;

bonding a thermal protection system onto said uniform outer bonding surface.

24. (Original) A method of insulating a fuel tank as described in claim 23, wherein said foam assembly is produced by:

filling a honeycomb core with an uncured foam material;

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applying said first solid film to said outer surface, said first solid film engaging said honeycomb core; and

curing said uncured foam material and said first solid film simultaneously such that said uniform outer bonding surface is generated.

25. (Original) A method of insulating a fuel tank as described in claim 23, further comprising:

generating a uniform inner bonding surface on said inner surface by bonding a second solid film to said inner surface, said uniform inner bonding surface generated prior to said applying a foam assembly to said fuel tank wall.

26. (Original) A method of insulating a fuel tank as described in claim 23, further comprising:

applying a first fabric layer to said first solid film prior to bonding said first solid film to said outer surface.

27. (Original) A method of insulating a fuel tank as described in claim 25, further comprising:

applying a second fabric layer to said second solid film prior to bonding said second solid film to said inner surface.